

# Light Emitting Diode (LED) Program Prescott Municipal Airport (PRC)

The Federal Aviation Administration (FAA), in an effort to improve runway safety and overall pilot awareness, installed a new Light Emitting Diode (LED) taxiway light system at Prescott Municipal Airport (PRC) in Prescott, Arizona. PRC was identified in 2003 by the Office of the Inspector General of the Department of Transportation (report number AV-2003-040) as one of the airports that experienced a high rate of runway incursions. Onsite evaluations conducted at PRC revealed that deterioration of the electrical system had rendered safety enhancing taxiway lighting systems inoperable on a portion of the airport. At the same time, the FAA was conducting evaluations of potential applications of LED technology for the National Airspace System (NAS). Thus, the linkage was established between low-cost, safety-enhancing lighting systems and energy-efficient LED technology.

The FAA led the effort to design, test, and evaluate a unique LED taxiway lighting system at PRC, with LEDs as the light source for blue, elevated taxiway edge lights and for flashing, yellow elevated runway guard lights (RGLs). LED technology requires much less power than traditionally used incandescent light sources. The new system uses a 2.8 amp electrical circuit instead of the traditional 6.6 amp circuit. Initial calculations indicated that the new system represents an energy efficient power alternative to the standard systems with no identified degradation in operational requirements while substantially reducing both the lifecycle cost and energy consumption.

The airport taxiway lighting system was redesigned to incorporate LED technology in order to show its potential to meet and/or exceed today's operational requirements at a reduced life cycle cost while achieving significant energy savings. A favorable evaluation may indicate that standard safety enhancement systems, namely taxiway edge lights and RGLs can be made available and more affordable to a wider range of airports, including those airports that support general aviation (GA) operations.

Both taxiway edge lights and RGLs are critical visual aids that provide situational awareness to enhance airport surface movement safety. The prototype system will be evaluated over the next few months. The primary goal of the evaluation is to demonstrate the safety and operational benefits of the LED system. In addition, the performance of the prototype 2.8 amp series circuit LED



taxiway edge lights, LED RGLs, and validation of the energy and cost benefits for this prototype system will be reviewed.

Preliminary data collected during functional and operational evaluations shows that the LED system is an operational equivalent to other FAA approved lighting systems. The new system successfully enhances pilot situational awareness while reducing energy consumption. It substantially improves energy efficiency and reduces associated life cycle costs 70-90 percent.

The new power distribution system delivers benefits to both the FAA and individual airports. The life cycle cost analyses indicate significant cost savings over the predicted 20-year life of the system. A small airport with 300 taxiway edge lights could save \$5700 per year in energy costs. Additional savings in maintenance and operational costs will also accrue over the life of the system.

## Point of Contact

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<http://www.faa.gov/and/and500/520/programs/led.htm>



**Federal Aviation  
Administration**

## Energy Consumption

### *Incandescent 6.6A Series Circuit with 30/45W Transformer*

Step #	Amps	Brightness Level	Percent Usage	Hours*	Load VA @ Each Fixture	Total Quantity Fixture	Annual kWh For Circuit	Annual kWh CCR @ 80% Efficiency
1	4.8	10%	10%	438*	21.27	300	2,795	3,494
2	5.5	30%	80%	3504	28.8	300	30,275	37,843
3	6.6	100%	10%	438	45.76	300	6,013	7,516

*Annual 6.6A Power Consumption 48,853 kWh*

### Prototype LED 2.8A with Interface Device

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### Location of LED Airport Lighting at PRC

